



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,668	04/22/2004	Douglas C. Burger		6831
<div>Douglas C. Burger 1501 W. 6th Street Austin, TX 78703</div>				
<div>7590 12/11/2007</div>				
<div>EXAMINER FENNEMA, ROBERT E</div>				
<div>ART UNIT 2183</div>				
<div>PAPER NUMBER</div>				
<div>MAIL DATE 12/11/2007</div>				
<div>DELIVERY MODE PAPER</div>				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/829,668	Applicant(s) BURGER ET AL.	
	Examiner Robert E. Fennema	Art Unit 2183	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-20 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-20 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2183

DETAILED ACTION

1. Claims 18-20 and 28-30 have been considered. Claims 21-27 and 31-36 have been cancelled as per Applicant's request. Claims 18-20 and 28-30 amended as per Applicant's request.

Claim Objections

2. In Claim 28, line 9 of the amended claims, a claim is made to "...respective set of said interconnected computation nodes such that results...", however, there have been no such nodes introduced to the claims at this point, therefore "said" should be removed from the claim to prevent any issues with antecedent basis.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 18-20, 24-29, and 31-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Requa et al. ("The Piecewise Data Flow Architecture: Architectural Concepts", herein Requa).

Art Unit: 2183

5. As per Claim 18, Requa teaches: A method for organizing instructions within an application program to be executed in a processor having a plurality of interconnected computation nodes, said method, comprising:

partitioning said application program into a plurality of instruction groups (Page 426, first column, second paragraph, instructions are grouped into blocks); and

assigning each of said instruction groups to a respective set of said interconnected computation nodes such that results yielded by an instruction within one of said instruction groups are sent directly to an instruction within another one of said instruction groups or an output operand associated with an instruction within one of said instruction groups is directly written to a register file to be read by an instruction within another one of said instruction groups as an input operand (Page 427, second column, second paragraph shows that any producer can be connected to any consumer, and Page 428 shows how instructions in one block can be dependant upon instructions in other blocks, requiring that results be sent from one block to the other, which can only be done directly or through registers).

6. As per Claim 19, Requa teaches: The method of claim 18, wherein said partitioning and assigning are performed by a compiler (Page 429, first column, "PDF Architecture").

Art Unit: 2183

7. As per Claim 28, Requa teaches: A computer storage medium having a computer program product for expressing dependency relationship of instructions within a program, said computer storage medium comprising:

computer program code for partitioning said application program into a plurality of instruction groups (Page 426, first column, second paragraph, instructions are grouped into blocks); and

computer program code for assigning each of said instruction groups to a respective set of said interconnected computation nodes such that results yielded by an instruction within one of said instruction groups are sent directly to an instruction within another one of said instruction groups or an output operand associated with an instruction within one of said instruction groups is directly written to a register file to be read by an instruction within another one of said instruction groups as an input operand (Page 427, second column, second paragraph shows that any producer can be connected to any consumer, and Page 428 shows how instructions in one block can be dependant upon instructions in other blocks, requiring that results be sent from one block to the other, which can only be done directly or through registers).

8. As per Claim 29, Requa teaches: The computer storage medium of claim 28, wherein partitioning the program into the plurality of groups of instructions is performed by a compiler (Page 429, first column, "PDF Architecture").

Art Unit: 2183

9. Claims 20 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Requa, in view of Fisher.

10. As per Claim 20, Requa teaches: The method of claim 18, but fails to teach: wherein said partitioning and assigning are performed by a run-time trace mapper.

While Requa teaches the article as disclosed in Claim 28, Requa does not teach that the partitioning of the program is done by a trace mapper. However, Fisher teaches of Trace Scheduling, where the basic blocks used by Requa are compacted, and instead use traces (Page 462, Section D), created and optimized by a scheduler (Page 482, second column, second paragraph). The advantage to this compaction method using traces allows for more efficient parallel code, done in a manner far more efficient than previous methods (Abstract). Given this advantage, one of ordinary skill in the art would have been motivated to use these traces in place of the basic blocks as taught by Requa to further increase the efficiency of the system.

11. As per Claim 30, Requa teaches: The computer storage medium of claim 28, but fails to teach:

wherein partitioning the program into the plurality of groups of instructions is performed by a run-time trace mapper.

While Requa teaches the article as disclosed in Claim 28, Requa does not teach that the partitioning of the program is done by a trace mapper. However, Fisher teaches

Art Unit: 2183

of Trace Scheduling, where the basic blocks used by Requa are compacted, and instead use traces (Page 462, Section D), created and optimized by a scheduler (Page 482, second column, second paragraph). The advantage to this compaction method using traces allows for more efficient parallel code, done in a manner far more efficient than previous methods (Abstract). Given this advantage, one of ordinary skill in the art would have been motivated to use these traces in place of the basic blocks as taught by Requa to further increase the efficiency of the system.

Response to Arguments

12. Applicant has argued that Requa does not teach the limitation of having results yielded by one instruction being sent directly to another instruction in another instruction group, or being written to a register file to be read by an instruction in another group. However, Requa does teach that blocks can be dependant upon one another, for examiner, on page 428 (the successor blocks). The only way a block could be dependent upon another block is if instructions in the block require results from the previous block, and the only way that such results could be sent to the successor block is to send them directly to the execution units, or to write them to a register to be read at a later time (depending upon when the instruction is scheduled to execute).

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2183

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Fennema whose telephone number is (571) 272-2748. The examiner can normally be reached on Monday-Friday, 8:45-6:15.

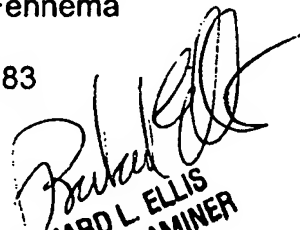
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2183

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert E Fennema
Examiner
Art Unit 2183

RF


RICHARD L. ELLIS
PRIMARY EXAMINER